

Application No.: 10/705,225
Attorney Docket: 071469-0305807
Client Reference: PC0269A

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REMARKS

Claims 1 and 20 are amended hereby. No claims are added or canceled. Accordingly, after entry of this Amendment, claims 1-23 will remain pending. Since claims 21-23 have been withdrawn from further consideration, claims 1-20 currently are under examination.

In the Office Action dated July 17, 2006, the Examiner rejected claims 1-3, 7-9, 11-13 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. (U.S. Patent No. 6,758,941) in view of Takeuchi et al. (U.S. Patent No. 5,935,337). Claims 4-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. and Takeuchi et al. and further in view of Nguyen (U.S. Patent No. 6,565,661). The Examiner also rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. in view of Takeuchi et al. and further in view of Legler et al. (U.S. Patent No. 6,155,524). Claims 14-19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. and Takeuchi et al. and further in view of Otsuki (U.S. Patent Application No. 2001/0003271). Next, the Examiner rejected claims 1-3, 7-9, 11-13 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. in view of Takeuchi et al. and Hayashi et al. (U.S. Patent No. 5,962,085). In addition, claims 4-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al., Takeuchi et al., and Hayashi et al. and further in view of Nguyen. The Examiner also rejected claims 10 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al., Takeuchi et al., and Hayashi et al. and further in view of Legler et al. Further, the Examiner rejected claims 14-19 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al., Takeuchi et al. and Hayashi et al. and further in view of Otsuki. Claims 1-3, 7-9, 11-13, and 17-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. in view of Carducci et al. (U.S. Patent Application Publication No. 2003/0037880). Additionally, the Examiner rejected claims 4-6 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. and Carducci et al. and further in view of Nguyen. Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. and Carducci et al. and further in view of Legler et al. The Examiner also

Application No.: 10/705,225
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rejected claims 14-16 under 35 U.S.C. § 103(a) as being unpatentable over Ookawa et al. and Carducci et al. and further in view of Otsuki. The Applicant respectfully disagrees with each of these rejections and, therefore, respectfully traverses the same.

Before addressing the rejections set forth by the Examiner, the Applicant respectfully notes that the rejections may be classified into one of two categories: (1) paragraphs 3-10 of the Office Action, which provides rejections of the claims based at least upon the combination of Ookawa et al. and Takeuchi et al., and (2) paragraphs 11-14 of the Office Action, which provides rejections of the claims based at least upon the combination of Ookawa et al. and Carducci et al. Since both of these combinations of references do not assist the Examiner with a rejection of the claims, the Applicant respectfully submits that the rejections should be withdrawn so that the claims may be passed to issuance.

Claims 1-20 recite an electrode plate assembly (claim 1) and a disposable electrode plate (claim 20) that combine a number of features including, among them, an electrode plate with a plurality of replaceable gas injection devices removably received within a plurality of gas injection holes. Support for this feature may be found in paragraph [0036] of the specification, for example. None of the references upon which the Examiner relies discuss or suggest at least this feature. Accordingly, the Applicant respectfully submits that the references cited by the Examiner do not make out a *prima facie* case of unpatentability under 35 U.S.C. § 103(a). As a result, the Applicant respectfully requests that the Examiner withdraw the rejections and pass this application quickly to issue.

Before addressing the references individually, the Applicant notes the Examiner's response to the Amendment filed on May 4, 2006. Specifically, the Examiner stated, at paragraph 16 of the Office Action, that the nozzle pipes 18A or 18B are welded to the first and second members 25, 26. The Examiner stated that welding the nozzle to the first or second member does not make the nozzle irremovable. According to the Examiner, the nozzle can be removed by cutting the weld or drilling out the nozzle. Both methods are known in the art. According to the Examiner, Takeuchi et al. does not teach that the nozzles are not removable, only that the nozzles are welded.

Application No.: 10/705,225
Attorney Docket: 071469-0305807
Client Reference: PC0269A

The Applicant respectfully disagrees with the Examiner's conclusion with respect to Takeuchi et al. According to the Applicant, those skilled in the art would not view the nozzles 18A, 18B in Takeuchi et al. as removable. Despite this disagreement, the Applicant has decided to amend the language presented by claims 1 and 20, with the hope that the amended language might assist the Examiner to find that the claims presented by this application are patentable over the references cited by the Examiner.

In amending claims 1 and 20, the Applicant has altered the language to state that the plurality of gas injection devices are "replaceable" and are "removably received" within the plurality of gas injection holes. The Applicant respectfully submits that this change in the language clarifies the scope of the claims and helps to distinguish the claims over the references cited by the Examiner. The Applicant respectfully requests, therefore, that the Examiner reconsider the rejection of the claims, withdraw the rejections, and pass claims 1-20 to issuance.

As noted in the response filed on May 4, 2006, Ookawa et al. describes a plasma processing unit and an electrode plate for a plasma processing unit. The upper electrode 2 has an electrode body 2A and an electrode plate 2B removably attached to the under surface of the electrode body 2A by means of fastening members 9, such as screws. (Ookawa et al. at col. 4, lines 39-45.) The electrode body 2A may be made from alumite-treated aluminum. (Ookawa et al. at col. 4, lines 45-48.) The electrode plate 2B may be made from alumite-treated aluminum, silicon, silicon carbide or carbon. (Ookawa et al. at col. 4, lines 50-53.) Gas is jetted through gas-dispersion holes 2D in the electrode plate 2B. (Ookawa et al. at col. 4, lines 56-60.)

As argued by the Applicant previously and as acknowledged by the Examiner, Ookawa et al. provides no discussion of a plurality of replaceable gas injection devices removably received within any gas injection holes. For this feature, the Examiner relied upon Takeuchi et al. In connection with this rejection, the Applicant respectfully submits that Takeuchi et al. does not cure the deficiency noted with respect to Ookawa et al. Takeuchi et al. describes a thin-film vapor deposition apparatus that includes a shower head 16 with cylindrical nozzle pipes 18A, each with a nozzle 18 positioned centrally in a lower end thereof. (Takeuchi et al. at col. 14, lines 33-39.) The circumferential outer walls of each of the cylindrical nozzle pipes

Application No.: 10/705,225
Attorney Docket: 071469-0305807
Client Reference: PC0269A

18A are welded to the respective first and second members 25, 26. (Takeuchi et al. at col. 14, lines 45-48; see also Fig. 10.) Similarly, the upper and lower ends of the circumferential outer walls of the nozzle pipe 18B are welded to the respective first and second members 25, 26. (Takeuchi et al. at col. 14, lines 64-67; see also Fig. 11.) In addition, the cylindrical nozzle pipe 18C has a lower end that is integrally joined to the first member 25 and an upper end fitted in a nozzle hole defined in the second member 26 and welded thereto. (Takeuchi et al. at col. 15, lines 10-13; see also Fig. 12. Emphasis added.) Since the embodiments of the nozzles pipes 18A, 18B, 18C are each welded to one or both of the first and second member 25, 26, the nozzle pipes 18A, 18B, 18C are not replaceable nor are they removably received within any holes, at least not without destructive removal of the nozzle pipes 18A, 18B, 18C and also a portion of the members to which they are welded. Accordingly, the Applicant respectfully submits that the combination of Ookawa et al. and Takeuchi et al. fail to render obvious any of claims 1-20.

Nguyen was discussed in the Amendment filed on May 4, 2006. As noted by the Applicant at that time, Nguyen describes a high flow conductance and high thermal conductance shower head. The showerhead plate is composed of a plate 14 with a thickness T having various delivery holes 18. (Nguyen at col. 6, lines 24-26.) The delivery holes have different sizes, a larger size 19 and a smaller size 18. (Nguyen at col. 6, lines 26-27.) Fig. 5 illustrates various embodiments of showerhead plates 14, 34, 44, 54, 64, 74, and 84. (Nguyen at col. 6, lines 63-65.) At no place does Nguyen describe a plurality of replaceable gas injection devices removably received in a plurality of delivery holes 18, 19. Accordingly, the Applicant respectfully submits that Nguyen cannot be combined with Ookawa et al. or Takeuchi et al. to render obvious any of claims 1-20.

Legler et al. is singularly deficient in addressing the deficiencies noted above with respect to Ookawa et al., Takeuchi et al., or Nguyen and, as a result, cannot be combined with the references to render obvious claims 1-20. Legler et al. describes a quick release locking system including a slotted bracket 80 and with T-shaped slots 84 for engaging pin heads 75 on a locking pin bracket 70. (Legler et al. at col. 3, lines 59-65.) There is no discussion of a plasma processing chamber, a showerhead, or any

Application No.: 10/705,225
Attorney Docket: 071469-0305807
Client Reference: PC0269A

other structure that would suggest that Legler et al. could or should be combined with Ookawa et al., Takeuchi et al., or Nguyen to render obvious any of claims 1-20.

Otsuki also fails to cure the deficiencies noted with respect to the remaining references. Otsuki describes a processing apparatus with a chamber having a high-corrosion-resistant sprayed film. There is no discussion of a plurality of gas injection devices coupled to a plurality of gas injection holes, among others of the features recited by the claims. Accordingly, the Applicant respectfully submits that Otsuki does not assist the Examiner with a rejection of any of claims 1-20.

Hayashi et al. also does not assist the Examiner with a rejection of any of the claims. Hayashi et al. describes an apparatus that includes input nozzles 33 that may be screwed into an arcuate tube 28. (Hayashi et al. at col. 10, lines 13-21.) There is, however, no discussion of an electrode plate with a plurality of replaceable gas injection devices removably received within a plurality of gas injection holes. Nor is there any suggestion that the nozzles 33 could be used in connection with an electrode plate. To the contrary, because Hayashi et al. describes a barrier plate 6 (see, e.g., Fig. 1) that is separate from the arcuate tube 28, this would seem to suggest that the nozzles 33 could not be used in connection with an electrode plate.

Carducci et al. also does not assist the Examiner with a rejection of any of the claims because Carducci et al. suffers from some of the same deficiencies noted above with respect to the other references relied upon by the Examiner. Carducci et al. describes a dielectric etch chamber with an expanded process window. As noted by the Examiner, the apparatus includes a first liner 134. (Carducci et al. at paragraph [0080].) The liner 134 includes apertures 348 fitted with nozzles 350a. (Carducci et al. at paragraph [0099]; see also Fig. 4.) The liner 134, however, is not an electrode, as evidenced by the addition of an RF generator 2920 in the embodiment illustrated in Fig. 29. (Carducci et al. at paragraph [0180].) Accordingly, like the remaining references, Carducci et al. does not describe or suggest, either alone or in combination with the remaining references, an electrode plate with a plurality of replaceable gas injection devices removably received within a plurality of gas injection holes. As a result, the Applicant respectfully requests that the Examiner reconsider the rejections based in part on this reference and withdraw the same.

Application No.: 10/705,225
Attorney Docket: 071469-0305807
Client Reference: PC0269A

In view of the foregoing, the Applicant respectfully requests that the Examiner withdraw the rejections of claims 1-20 under 35 U.S.C. § 103(a) so that this application may be passed quickly to issue.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

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